Total No. = 03 pages

Q.P. Code: MBN105

M.B.B.S. 1st Prof.

(New Scheme w.e.f. 2019 admission onwards)

BF/2022/06

Biochemistry – A

M.M. : 100 Time : 3 Hours(First30 Min. for MCQs)

Note: 1. **Use OMR Sheet to answer Multiple Choice Questions(MCQs).**

2. Attempt all questions. Illustrate your answers with suitable diagrams
3. **NO SUPPLEMENTARY SHEET SHALL BE ALLOWED/PROVIDED**
4. ***The student must write Q.P. Code in the space provided on OMR Sheet and the Title page of the Answer Book.***

Q.1 **MCQs** (Attempt on OMR sheet) [1x20]

1. A 4 year old boy presented with epicanthal fold, strabismus and mental retardation. On urine examination, ferric chloride test was positive and mousy odor smell. There was history of seizures, eczema and limb spasticity. Name the clinical condition.
   a. Phenyl ketonuria b. Cystinuria
   c. Homocystinuria d. Alkaptonuria

2. Bacterial synthesis of folic acid by the human intestinal flora is inhibited when sulphonamides is administered. Identify the type of inhibition.
   a. Allosteric inhibition b. Non-competitive inhibition
   c. Competitive inhibition d. Enzyme poisoning

3. A girl accidently ingests lead paint and develops acute abdominal pain, tingling sensations of hands and legs along with weakness. Which enzyme is inhibited in this child?
   a. ALA synthase b. Heme oxygenase
   c. Coproporphyrinogen oxidase d. ALA dehydratase

4. Biologically active sugars are in the D configuration such as D-Glucose and D-Galactose. D-configuration means:
   a. All the OH groups are on the right side.
   b. The OH group at C1 is on the right side
   c. The OH group on the penultimate carbon is on the right side.
   d. The OH group on C3 is on the right side always.

5. Liver uses glucose at a significant rate only when blood glucose levels are elevated . This is due to the following **EXCEPT**
   a. Insulin increases the transcription of glucokinase gene.
   b. Insulin induces the uptake of glucose by GLUT-2 across the liver parenchymal cells.
   c. Km of glucokinase is considerably greater than normal blood glucose concentration.
   d. Glucokinase is not inhibited by glucose-6 phosphate

6. Cadiolipins are composed of the following-
   a. Glycerol, choline and phosphoric acid
   b. Glycerol, fatty acids and phosphoric acid
   c. Glycerol, inositol and phosphoric acid
   d. Glycerol, serine and phosphoric acid

7. Zellweger syndrome is a rare autosomal recessive condition, characterized by early mortality in childhood. It is caused by:
   a. Mitochondrial degradation b. Defective formation of peroxisomes
   c. Break up of the cell wall d. Absence of ribosomes

8. The respiratory chain of the mitochondria has many complexes. The component of the respiratory chain that reacts directly with molecular oxygen is:
   a. Cyt b b. Cyt c
   c. CoQ d. Cyt aa3

9. Estimation of the activity of isoenzymes of Creatine phosphokinase in serum is useful in the differential diagnosis of:
   a. Muscle and heart diseases b. Muscle and liver diseases
   c. Liver and heart diseases d. Liver and kidney diseases

10. A lady presented with tingling sensation in legs and hands along with lesions in the angle of mouth with red tongue. On investigation, glutathione reductase activity was found to be low. She is suffering from deficiency of which vitamin?
   a. Riboflavin b. Pyridoxine
   c. Vitamin B12 d. Folic Acid

11. Glycosaminoglycans (GAGs) have many biological functions in our body. Identify the GAG which is responsible for corneal transparency.
   a. Keratan sulphate b. Heparin sulphate
   c. Chondroitin sulphate d. Hyaluronic acid

12. The pyruvate dehyrogenase complex (PDH complex) brings about the conversion of pyruvate to acetyl CoA. Which combination of cofactors is involved in this important reaction?
   a. NAD+ , biotin and TPP b. TPP, lipoic acid and NAD+
   c. Pyridoxal phosphate, FAD and lipoic acid
   d. Biotin, FAD and TPP

13. Galactosemia is a rare, hereditary disorder of carbohydrate metabolism that affects the body's ability to convert galactose to glucose. The classical Galactosemia is due to the deficiency of:
   a. Hexosaminidase b. Glucocerebrosidase
   c. Sphingomyelinase
   d. Galactose-1-phosphate uridyl transferase

14. Which of the following is the essential fatty acid in the human diet?
   a. Oleic acid b. Palmitic acid
   c. Linolenic acid d. Arachidic acid

15. Vitamins are essential for proper functioning of certain metabolic pathways.The conversion of Propionyl CoA to Succinyl CoA requires two vitamins. They are:
   a. Thiamin and Riboflavin b. Thiamine and Biotin
   c. Biotin and Vitamin B12 d. Vitamin B12 and Folic acid

16. An anti-inflammatory substance that inhibits cyclooxygenase enzyme and prevents the synthesis of prostaglandins is :
   a. Sulphadiazine b. Paracetamol
   c. Penicillin d. Aspirin

17. Refsum's disease is characterized by accumulation of phytanic acid in the body. This is due to defect of:
   a. Alpha-oxidation b. Beta- oxidation
   c. Omega oxidation d. Deficiency of Endoplasmic reticulum

18. Which of the following lipoprotein will be elevated in the blood stream after intake of meals in a patient with lipoprotein lipase deficiency?
   a. Chylomicron
   b. Non esterified fatty acids
   c. Low density lipoprotein
   d. High density lipoprotein

19. The secondary structure of proteins is formed by alpha helical structure and beta pleated sheet. The bonds stabilizing them are:
   a. Disulphide bonds
   b. Hydrophobic bonds
   c. Hydrogen bonds
   d. Electrostatic bonds

20. The only amino acid that undergoes oxidative deamination to a significant extent and liberates free ammonia, which is then further metabolized to urea is :
   a. Aspartic acid
   b. Glutamic acid
   c. Valine
   d. Methionine

Q.2. A new born baby had severe abdominal distention, abdominal pain and diarrhea after being fed breast milk. Stool analysis revealed the presence of reducing sugar.
   a. What is your diagnosis?
   b. What is the enzyme defect and what is the biochemical basis of the symptoms of the newborn.
   c. Enumerate different reducing sugars. Which out of them is most likely present in the stool of the newborn?
   d. How can it be treated? [2+4+3+3]

Q.3. **Write short notes on:-** [5x4]
   a. Epimers and amomers
   b. Essential fatty acids
   c. Liposomes and its significance
   d. One carbon pool

Q.4. **Explain why:-** [3x5]
   a. Blood collection tube containing sodium fluoride is used to collect specimen for blood glucose estimation.
   b. Sulpha drugs are avoided in patients with G6PD deficiency
   c. Homocysteinurea/Homocystinurea is a risk factor for CAD
   d. Some amount of glucose is required by adipose tissue for its normal function
   e. Urine turns black on standing in patient with alkaptonuria

Q.5. **Write short notes on (applied aspect):-** [6x3]
   a. Discuss the antioxidant role of various vitamins
   b. Describe ammonia transport with reasons of hyperamnonemia. Why ammonia is toxic for body?
   c. Discuss the role of enzymes in health and disease.

Q.6. **Write short notes:-** [5x3]
   a. Discuss briefly the β-oxidation of palmitic acid along with its energetics.
   b. Discuss various inhibitors of electron transport chain along with their site of inhibition.
   c. Discuss the boundaries of doctor-patient relationship.
